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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/781,832	02/20/2004	John H. Boswell	118774	5471
25944	7590	12/20/2005		
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			EXAMINER KERNS, KEVIN P	
			ART UNIT	PAPER NUMBER
			1725	

DATE MAILED: 12/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/781,832	<b>Applicant(s)</b> BOSWELL, JOHN H.	
	<b>Examiner</b> Kevin P. Kerns	<b>Art Unit</b> 1725	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 November 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) 17-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☒ Claim(s) 6,8,10 and 14 is/are objected to.
- 8) ☒ Claim(s) 1-20 are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/20/04, 5/20/04</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of Group I (claims 1-16) in the reply filed on November 2, 2005 is acknowledged. The traversal is on the ground(s) that the search and examination could be made without a serious burden. This is not found persuasive because the Group II product claims 17-20 belong in classes 428 and 123. As a result, an additional search in these classes would create a serious burden and would result in uncovering additional prior art references that would apply only to the product claims, but not the method/mold claims of claims 1-16.

The requirement is still deemed proper and is therefore made FINAL.

### ***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "separate upstanding leg" (in claims 4 and 9) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures

must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: "11" (Figures 4 and 5); "15" and "16" (Figure 4); "102b" and "102c" (Figure 6). Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

4. The drawings are objected to because a line/arrow should be drawn between reference number "102" and a portion of Figure 6 for clarity. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

#### ***Specification***

5. The abstract of the disclosure is objected to because the reference numbers in the abstract should include parentheses. Correction is required. See MPEP § 608.01(b).

6. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

#### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC (See 37 CFR 1.52(e)(5) and MPEP 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text are permitted to be submitted on compact discs.) or  
REFERENCE TO A "MICROFICHE APPENDIX" (See MPEP § 608.05(a). "Microfiche Appendices" were accepted by the Office until March 1, 2001.)
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

In this instance, the specification lacks section headings.

7. The disclosure is objected to because of the following informalities: on page 3, in the description of Figures 2 and 3, replace "perform" with "preform" in both instances. On page 7, 4<sup>th</sup> line, replace "loss" with "lost" before "wax". On page 8, 1<sup>st</sup> line, delete "3;13" before "stage". Throughout pages 6 and 7, all instances of two adjacent drawing reference numbers should be enclosed with parentheses and/or separated by commas rather than semicolons. Appropriate corrections and/or clarifications are required for these and other errors that occur throughout the specification.

#### ***Claim Objections***

8. Claims 6, 8, 10, and 14 are objected to because of the following informalities: in claim 6, 1<sup>st</sup> line, replace "defector" with "deflector". In claim 8, replace "downpipe" with "downpole". In claim 10, 2<sup>nd</sup> line, insert "element" after "deflector" to obtain proper antecedent basis. In claim 14, 2<sup>nd</sup> line, replace "perform" with "preform". Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 112***

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 4, 9, 15, and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With regard to claim 4, it is unclear what is meant by “to present the deflector element”. It is believed that “present” should be changed to “attach”, “affix”, “connect”, or another equivalent term.

With regard to claims 4 and 9, it is unclear what structure the “separate upstanding leg” is. Is it the same as the “downpole”?

Claims 15 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite in that it fails to point out what is included or excluded by the claim language. These claims are omnibus type claims.

### ***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1-5, 7-10, and 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Graham et al. (US 4,773,467).

Graham et al. disclose a method and apparatus for casting articles, in which the method and apparatus include forming a ceramic mold 20 (forming an array of ceramic molds 40 via a lost wax process) with a displaced deflector element (ceramic baffle plate 34 comprising a circular baffle 116 coated with an insulating material 118) adjacent to a portion of the principal mold formation 20,40 (secured to a downpole 36



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and a base plate 44 that includes several “upstanding legs” of the molds 20,40), such that the deflector element (34,116) is operative to control the rate of heat loss in the region of the deflector element 34,116 (abstract; column 1, lines 43-68; column 2, lines 1-47; column 3, line 34 through column 9, line 49; and Figures 1-7).

13. Claims 1-4, 7-9, and 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by EP 0 059 050 A2.

EP 0 059 050 discloses a method and mold used in casting components, in which the method and mold include forming a ceramic mold 10 (comprising an array of ceramic mold cavities 38 via a lost wax process) with a displaced deflector element (cylindrical heat shield 40) adjacent to a portion of the principal mold formation (secured to a downpole and a chill plate 42 that includes several “upstanding legs” of the molds), such that the deflector element 40 is operative to control the rate of heat loss in the region of the deflector element 40 (abstract; pages 5-15; and Figures 1 and 2).

14. Claims 1-3, 7, 8, and 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by GB 2 259 660.

GB 2 259 660 discloses a method and mold for casting components, in which the method and mold include forming a ceramic shell mold 30 (comprising an array of article portions 32 via a lost wax process from wax pattern 10) with a displaced deflector element (protruding portion adjacent secondary chamber 40) adjacent to a portion of the principal mold formation (secured to a downpole of the mold), such that the deflector

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element is operative to control the rate of heat loss in the region of the deflector element (abstract; page 2, line 18 through page 4, line 9; page 4, line 24 through page 8, line 8; and Figures 1-5).

15. Claims 1, 2, 7, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Thompson et al. (US 6,276,432).

Thompson et al. disclose a directional solidification method and mold used in casting components, in which the method and mold include forming a ceramic shell mold 20 (made via a lost wax process) with a displaced deflector element (upper thermal baffle 44) adjacent to a portion of the principal mold formation 20, such that the deflector element 44 is operative to control the rate of heat loss in the region of the deflector element 44 (abstract; column 1, lines 51-67; column 2, lines 1-25 and 40-67; column 3, line 1 through column 5, line 63; and Figures 1 and 2).

16. Claims 1, 2, 7, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Barrow et al. (US 3,706,338).

Barrow et al. disclose a method and mold with a radiation shield for use in casting components, in which the method and mold include forming a ceramic shell mold 2 (made via a lost wax process) with a displaced deflector element (heat shield 26) adjacent to a portion of the principal mold formation 10, such that the deflector element 26 is operative to control the rate of heat loss in the region of the deflector

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element 26 (abstract; column 1, lines 31-51 and 63-67; column 2, lines 1-68; column 3, lines 1-30; and Figures 1-3).

***Claim Rejections - 35 USC § 103***

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graham et al. (US 4,773,467) in view of JP 59-174265.

Graham et al. disclose the features of claims 1, 5, 7, and 10. Graham et al. do not specifically disclose the use of a magnesium oxide coating.

However, JP 59-174265 discloses a ceramic casting mold for directional solidification of metal, in which the casting mold is coated with a low emission coating, in which the coating includes magnesium oxide, such that the coating is advantageous for providing a higher radiation efficiency than that of the ceramic mold body, thus increasing the temperature gradient and casting speed (abstract; and Figures 1 and 2).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the method and apparatus for casting articles, as disclosed by Graham et al., by using a magnesium oxide coating, as taught by JP 59-174265, in order to provide a higher radiation efficiency than that of the ceramic

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mold body, thus increasing the temperature gradient and casting speed (JP 59-174265; abstract).

19. Claims 5, 6, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over any one of EP 0 059 050, GB 2 259 660, Thompson et al. (US 6,276,432), or Barrow et al. (US 3,706,338) in view of JP 59-174265.

EP 0 059 050, GB 2 259 660, Thompson et al., and Barrow et al. individually disclose the features of claims 1 and 7. Neither EP 0 059 050, GB 2 259 660, Thompson et al., nor Barrow et al. specifically discloses the use of a coating with a low emission material.

However, JP 59-174265 discloses a ceramic casting mold for directional solidification of metal, in which the casting mold is coated with a low emission coating, in which the coating includes magnesium oxide, such that the coating is advantageous for providing a higher radiation efficiency than that of the ceramic mold body, thus increasing the temperature gradient and casting speed (abstract; and Figures 1 and 2).

It would have been obvious to one of ordinary skill in the art at the time the applicant's invention was made to modify the method and apparatus for casting articles, as disclosed individually by EP 0 059 050, GB 2 259 660, Thompson et al., and Barrow et al., by using a magnesium oxide (low emission) coating, as taught by JP 59-174265, in order to provide a higher radiation efficiency than that of the ceramic mold body, thus increasing the temperature gradient and casting speed (JP 59-174265; abstract).

**Conclusion**

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The Horton et al., Staub et al., Stanton et al., and Horwood references are also cited in PTO-892.

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kevin P. Kerns whose telephone number is (571) 272-1178. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kevin P. Kerns *Kevin Kerns 12/16/05*  
Primary Examiner  
Art Unit 1725

*KPK*  
kpk  
December 10, 2005